Lactate Expression, Mortality, and Length of Stay in Emergency Department Patients with Sepsis and Intubation

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Introduction: Patients in septic shock with a lactate <2 have a mortality of 20-46%. Our prior work reported that emergency department (ED) patients with a second lactate ≥2 (lac) have a two-fold increase in 30-day mortality when compared to patients with a second lactate <2 (alac). On secondary analysis, we found that intubated patients with a second lactate ≤2 have a longer hospital length of stay (LOS). Our objective is to further scrutinize this 30-day mortality and LOS.

Methods: This is a retrospective cohort study of an eight-hospital health system using data from the electronic medical record. Inclusion criteria consisted of patients ≥18 years of age who presented to the ED from 1/1/2017 to 11/30/2022 with ≥2 lactate levels measured in the ED, were diagnosed with sepsis, and admitted to the intensive care unit within 24 hours. Patients were classified based on their lactate values. Multivariable regression analysis was performed for 30-day mortality and LOS, adjusting for vitals, BMI, DNR status, and intubation timing.

Results: 1285 patients met inclusion criteria, were intubated, and categorized based on their lactate expression: alac-> alac (reference; 111/1285, 8.9%), alac-> lac (28/1285, 2.2%), lac-> alac (259/1285, 20.2%), and lac-> lac (887/1285, 69.0%). Lac-> lac had a significantly higher 30-day mortality (OR = 2.058, 95% CI = [1.353, 3.154]) compared to alac-> alac. Lac-> alac had a significantly increased LOS (OR = 1.133 (95% CI = [1.003, 1.280]) compared to alac-> alac.

Conclusions: Patients in the lac-> lac group had a two-fold increase in 30-day mortality when compared to alac-> alac. The lac-> alac group consistently had a greater LOS compared to alac-> alac. However, no further associations existed between the lactate expression category and LOS. Our prior work did not adjust for DNR and intubation timing, which may have spuriously augmented the LOS differences.